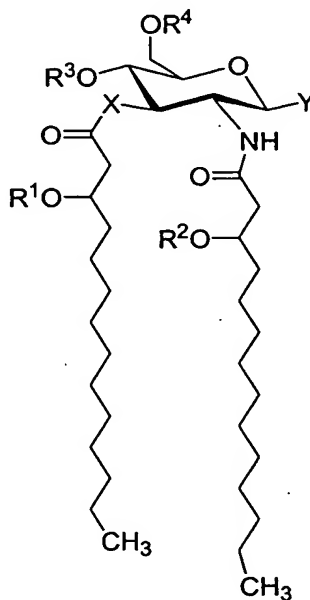


WHAT IS CLAIMED IS:

1 1. A method for modulating the production of cytokines in a subject in
2 need of such modulation comprising administering to the subject an effective amount of one
3 or more compounds having the formula:



4
5 and pharmaceutically acceptable salts thereof, wherein

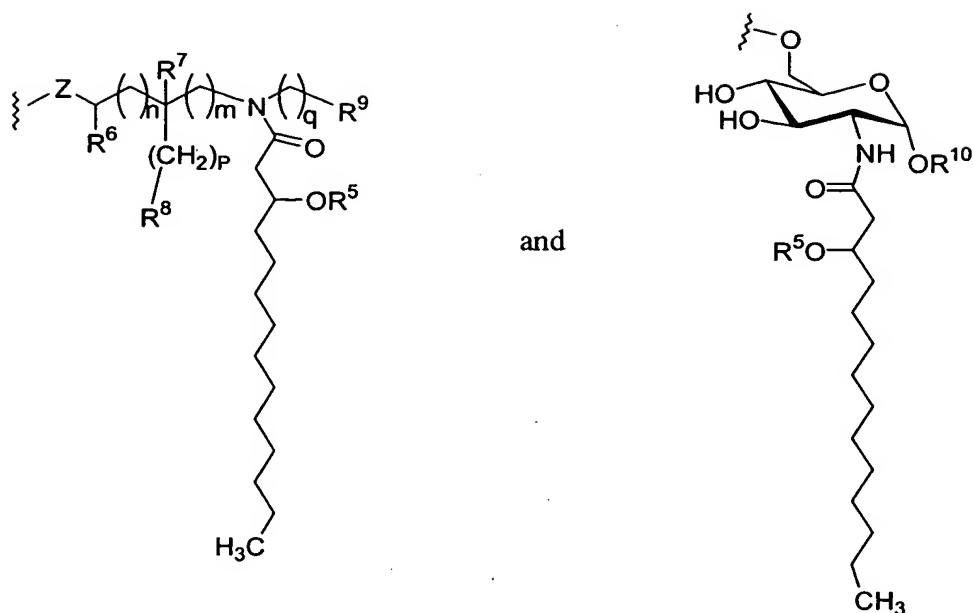
6 X is a member selected from the group consisting of $-O-$ and $-NH-$;

7 R^1 and R^2 are each members independently selected from the group consisting
8 of (C_2-C_{24}) acyl;

9 R^3 is a member selected from the group consisting of H and $-PO_3R^{11}R^{12}$,
10 wherein R^{11} and R^{12} are each members independently selected from the group consisting of
11 $-H$ and (C_1-C_4) alkyl;

12 R^4 is a member selected from the group consisting of $-H$, $-CH_3$ and
13 $-PO_3R^{13}R^{14}$, wherein R^{13} and R^{14} are each members independently selected from the group
14 consisting of $-H$ and (C_1-C_4) alkyl; and

15 Y is a radical selected from the group consisting of



and

wherein the subscripts n , m , p and q are each independently an integer of from 0 to 6;

R^5 is (C₂-C₂₄)acyl;

R^6 and R^7 are members independently selected from the group consisting of H and CH₃;

R^8 and R^9 are members independently selected from the group consisting of H, OH, (C₁-C₄)alkoxy, -PO₃H₂, -OPO₃H₂, -SO₃H, -OSO₃H, -NR¹⁵R¹⁶, -SR¹⁵, -CN, -NO₂, -CHO, -CO₂R¹⁵, -CONR¹⁵R¹⁶, -PO₃R¹⁵R¹⁶, -OPO₃R¹⁵R¹⁶, -SO₃R¹⁵ and -OSO₃R¹⁵ wherein R¹⁵ and R¹⁶ are each members independently selected from the group consisting of H and (C₁-C₄)alkyl;

R^{10} is a member selected from the group consisting of H, CH₃, -PO₃H₂, -phosphonooxy(C₂-C₂₄)alkyl, and -carboxy(C₁-C₂₄)alkyl; and

Z is -O or -S-;

with the proviso that when R^3 is -PO₃R¹¹R¹², R^4 is other than -PO₃R¹³R¹⁴, and with the further proviso that when R^3 is -PO₃H₂, R^4 is H, R^{10} is H, R^1 is *n*-tetradecanoyl, R^2 is *n*-octadecanoyl and R^5 is *n*-hexadecanoyl, then X is other than -O-.

2. A method in accordance with claim 1, wherein the compound or compounds are administered in the form of pharmaceutically acceptable salts.

3. A method in accordance with claim 1, comprising administering a prodrug or prodrugs of the compound or compounds.

1 4. A method in accordance with claim 1, wherein the compound or
2 compounds are administered in the form of a composition further comprising one or more
3 pharmaceutically acceptable carriers.

1 5. A method in accordance with claim 1, wherein the compound or
2 compounds are administered in the form of an aqueous composition comprising water and
3 one or more surfactants.

1 6. A method in accordance with claim 5, wherein said one or more
2 surfactants are selected from the group consisting of dimyristoyl phosphatidyl glycerol
3 (DPMG), dipalmitoyl phosphatidyl glycerol (DPPG), distearoyl phosphatidyl glycerol
4 (DSPG), dimyristoyl phosphatidylcholine (DPMC), dipalmitoyl phosphatidylcholine (DPPC),
5 distearoyl phosphatidylcholine (DSPC); dimyristoyl phosphatidic acid (DPMA), dipalmitoyl
6 phosphatidic acid (DPPA), distearoyl phosphatidic acid (DSPA); dimyristoyl phosphatidyl
7 ethanolamine (DPME), dipalmitoyl phosphatidyl ethanolamine (DPPE) and distearoyl
8 phosphatidyl ethanolamine (DSPE).

1 7. A method in accordance with claim 5, wherein the molar ratio of said
2 compound or compounds to surfactant is from about 10:1 to about 1:10.

1 8. A method in accordance with claim 1, wherein at least one of said R^1 ,
2 R^2 and R^5 are selected from the group consisting of (C_2-C_6) acyl.

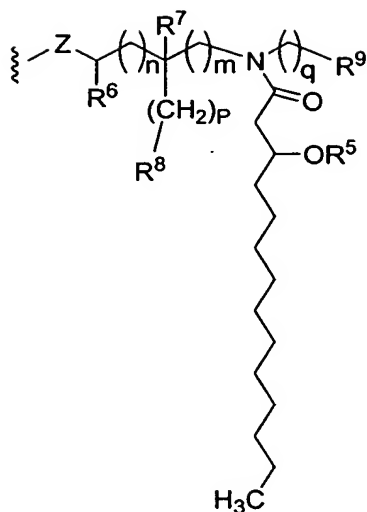
1 9. A method in accordance with claim 1, wherein at least one of said R^1 ,
2 R^2 and R^5 is selected from the group consisting of (C_2-C_6) acyl and the total number of carbon
3 atoms in R^1 , R^2 and R^5 is from about 6 to about 22.

1 10. A method in accordance with claim 1, wherein at least one of said R^1 ,
2 R^2 and R^5 are selected from the group consisting of (C_2-C_6) acyl and the total number of
3 carbon atoms in R^1 , R^2 and R^5 is from about 12 to about 18.

1 11. A method in accordance with claim 1, wherein X and Z are both -O-.

1 12. A method in accordance with claim 1, wherein R^1 , R^2 and R^5 are each
2 independently selected from the group consisting of $(C_{12}-C_{24})$ acyl with the proviso that the
3 total number of carbon atoms in R^1 , R^2 and R^5 is from about 44 to about 60.

- 1 13. A method in accordance with claim 12, wherein said total number of
2 carbon atoms is from about 46 to about 52.
- 1 14. A method in accordance with claim 12, wherein X and Z are both -O-.
- 1 15. A method in accordance with claim 1, wherein at least one of said R¹,
2 R² and R⁵ are selected from the group consisting of (C₆-C₁₂) acyl.
- 1 16. A method in accordance with claim 1, wherein at least one of said R¹,
2 R² and R⁵ are selected from the group consisting of (C₆-C₁₂) acyl and the total number of
3 carbon atoms in R¹, R² and R⁵ is from about 18 to about 36.
- 1 17. A method in accordance with claim 15, wherein at least one of said R¹,
2 R² and R⁵ is a C₆ acyl group and at least one of said R¹, R² and R⁵ is a C₁₀ acyl group.
- 1 18. A method in accordance with claim 1, wherein said compound or
2 compounds is administered to said subject by a route selected from the group consisting of
3 parenteral, oral, intravenous, infusion, intranasal, inhalation, transdermal and transmucosal.
- 1 19. A method in accordance with claim 1, wherein said compound or
2 compounds is administered intranasally.
- 1 20. A method in accordance with claim 1, wherein the production of
2 cytokines in the subject is enhanced.
- 1 21. A method in accordance with claim 1, wherein the production of
2 cytokines is inhibited.
- 1 22. A method in accordance with claim 1, wherein Y is



and R^8 is CO_2H .

23. A method in accordance with claim 22, wherein X is O, Y is O, n, m, p and q are 0; R^3 is phosphono; and R^4 , R^6 , R^7 and R^9 are hydrogen.

24. A method in accordance with claim 22, wherein R^1 , R^2 and R^5 are all C_6 acyl.

25. A method in accordance with claim 22, wherein R^1 , R^2 and R^5 are all C_7 acyl.

26. A method in accordance with claim 22, wherein R^1 , R^2 and R^5 are all C_8 acyl.

27. A method in accordance with claim 22, wherein R^1 , R^2 and R^5 are all C_9 acyl.

28. A method in accordance with claim 22, wherein R^1 , R^2 and R^5 are all C_{10} acyl.

29. A method in accordance with claim 22, wherein R^1 , R^2 and R^5 are all C_{11} acyl.

30. A method in accordance with claim 22, wherein R^1 , R^2 and R^5 are all C_{12} acyl.

1 31. A method in accordance with claim 22, wherein R^1 , R^2 and R^5 are all
2 C_{14} acyl.

1 32. A method in accordance with claim 22, wherein at least one of R^1 , R^2
2 and R^5 is C_6 acyl and at least one other of R^1 , R^2 and R^5 is C_{10} acyl.

1 33. A method in accordance with claim 22, wherein R^1 is C_{10} acyl and R^2
2 and R^5 are both C_6 acyl.

1 34. A method in accordance with claim 22, wherein R^5 is C_{10} acyl and R^1
2 and R^2 are both C_6 acyl.

1 35. A method in accordance with claim 22, wherein R^1 is C_6 acyl and R^2
2 and R^5 are both C_{10} acyl.